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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/827,810	04/06/2001	Ingemar Bystedt	333.773PAT	6864

7590

01/25/2005

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EXAMINER
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VU, TUAN A

ART UNIT	PAPER NUMBER
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2124

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/827,810	<b>Applicant(s)</b> BYSTEDT ET AL.	
	<b>Examiner</b> Tuan A Vu	<b>Art Unit</b> 2124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2001.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 11-33 (1-10 canceled) is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. This action is responsive to the Applicant's response filed 4/6/2001.

As indicated in Applicant's response, claims 1-10 have been amended; and claims 11-33 added. Claims 11-33 are pending in the office action.

#### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 11-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alpern et al., USPN: 6,226,653 ( hereinafter Alpern) in view of Nilsen, USPN: 5,687,368 ( hereinafter Nilsen).

As per claim 11, Alpern discloses a method of supervising the execution of one or more program sections written in an object-oriented programming language, comprising:

starting a program section (e.g. Fig. 4, 5) and creating an object as an instance of a class

(Note: Object-oriented and garbage collecting disclose creation object as instance of class – see Background and Fig. 1 related text);

storing in a memory one or more information units (e.g. *buffer 175, remember set, counter 172* – Fig. 4; col. 9, lines 13-29) associated with the created object and expiration time period associated with stored information units (e.g. Fig. 9; col. 12, line 50 to col. 13, line 24 – Note: counter associated expiration status of an entry reads information units associated with expiration time period associated with stored information units);

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terminating the program section (e.g. Fig. 5 – Note: evoking an object instance inherently disclose its termination);

removing the one or more information units stored in the memory when the created object is completed or inactive (e.g. step 940 – Fig. 9);

scanning the memory to identify one or more information units having been stored in the memory for a time period longer than the expiration time period ( steps 930, 950 – Fig. 9).

However, Alpern does not disclose that the identified information unit or units in memory scanning step triggering an alarm signal even though Alpern discloses Java heap checking and the desirability to avert the exhaustion of heap memory (col. 2, lines 11-46). The concept of generating an Exception/alarm when a violation in memory or execution time reference conflict is encountered in most language programming was a known concept at the time of the invention. Nilsen, in a system to implement structures to temporarily store runtime objects in view of their eligibility for being garbage collected analogous the Alpern's method, discloses generating an interrupt upon determining a reference error and notifying such error (e.g. col. 12, lines 5-37; col. 14, lines 20-25). Official notice is taken that the use of interrupt or alarm/exception handling to address memory reference violation was a known concept because otherwise without such real-time alarm handling the violation of memory would have been more extensive. It would have been obvious for one of ordinary skill in the art at the time the invention was made to create an alarm signal as soon as a situation wherein potential bad reference can result from accessing a completed object as suggested via the removing of un-accessed objects by Alpern because of the benefits from the teachings by Nilsen in light of the above notice.

**As per claim 12**, Alpern does not explicitly disclose recording a starting time of the expiration time period; but this start time limitation would have been implicit disclosed because without a start time, there would be no way of telling whether a time interval has expired.

**As per claim 13**, Alpern discloses determining if the created object is active or inactive ( Fig. 9).

**As per claim 14**, Alpern does not expressly disclose delaying the removing step after lapse of the expiration time period if the created object is active; but Alpern discloses segregating of objects into temporary buffer or minor collection based on age of objects; and delaying their removal after processing a minor collection ( col. 9, lines 42 to col. 10, line 4) and the step of putting certain middle-aged and active objects in a remembered set when such object is still in use (e.g. step 1055 – Fig. 10). It would have been obvious for one of ordinary skill in the art at the time the invention was made to wait until checking that the object is definitely no longer active before evicting the entry from the remembered set; because a premature removal without checking can lead to bad memory reference conflict according to the motivation using Nilsen used in claim 11 above.

**As per claim 15**, the limitations such as:

determining whether the created object is active;

the one or more information units triggering the alarm signal when the created object is inactive, and

delaying the triggering of the alarm signal when the created object is active, have been addressed in claims 11 and 14.

**As per claim 16**, Alpern does not expressly disclose identifying one or more information units ( i.e. remembered set entries) in the memory that have been stored longer than the expiration time period. But in view of the features being addressed in claim 14 such as to examine objects that reach some expiration time but are determined to be still in use thus delayed from being removed, the instant limitation is another way of describing the equivalent limitation of claim 14; hence would have been obvious for the same reasons.

**As per claim 17**, Alpern does not expressly disclose generating a notification message when one or more information units have been identified. Alpern only disclose a process by which results from the process of scanning old objects are submitted to garbage collection cycle, a message or command being passed is suggested. Official notice is taken that the use message to notify the advent of interrupt or an exception in order to take measures addressing memory reference violations was a known concept because otherwise without such real-time alarm handling or message passing the violation of memory would have been more extensive to the rest of the processing system. The process of sending a message to notify a alarm or a state change was a known concept in data transmission or distributed processes; and is evidenced via Nilsen in that Nilsen discloses sending message for notifying the controller for request of a fix up (e.g. col. 14, lines 20-25). It would have been obvious for one of ordinary skill in the art at the time the invention was made to create an alarm signal as soon as a potential memory conflict is determined wherein such alarm be accompanied of a message notifying the controller for a corrective action as taught by Nilsen; so to add such notifying message to Alpern's method after an object/entry being too old to remain in cache as taught by Alpern because this can allow corrective action as taught by Nilson in light of the above official notice.

**As per claim 18**, Alpern does not explicitly disclose maintaining statistical information about a number of instances in each class. But Alpern discloses bit increment in conjunction with entering an object ( i.e. instance of a class) in a write set of memory buffer; and a counter tracking new object (e.g. col. 8, lines 31-35) and when it gets accounted for in a 'remembered set' ( e.g. col. 6, lines 47 to col. 7, line 4; col. 7, line 60 to col. 8, line 31). The write of an active object instance into memory being associated with a counter and an increment thereof, amounts to the teaching of a tracking of the live instance of objects that can affect the memory resources; hence would read on the teaching of maintaining a statistical information about a number of instances in each class; hence indirectly discloses such limitation. In case it does not, this maintaining limitation would have been obvious because one of ordinary skill in the art at the time the invention was made would be motivated to implement the counter as taught by Alpern so to support the statistical tracking of number of class being instantiated and alive that would effect memory resources; and thereby enable the analysis of which objects as they are being fetched into runtime memory to accommodate of their number being a threat to the cache resources, such resources being at stakes and being addressed via Alpern's ( combined with teachings by Nilsen) techniques to avert memory overloading or resources exhaustion.

**As per claim 19**, the limitation as to generating a message when a usage volume exceeds a predetermined level would have been obvious by virtue of the rationale as set forth in claim 18.

**As per claim 20**, Alpern discloses a method of supervising the execution of one or more program sections written in an object-oriented programming language, comprising:

starting (a program section) and creating (an object);

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storing (information units identifying the created object);  
terminating ( the program section);  
removing ( information units stored in the memory when the created object is completed or inactive);  
scanning the memory (to identify one or more information units having been stored ... longer than a predetermined time period); and  
sending an alarm signal (for each information unit identified in the scanning step... the created object is inactive.

All these steps limitations have been addressed in claim 11; and are rejected herein using the corresponding rejections as set forth therein.

**As per claim 21**, refer to claim 14 for the rejection addressing the delay of removing of information units when the created object is found to be active and sending an alarm in conjunction thereof as recited in claim 11.

**As per claim 22**, Alpern discloses an apparatus for supervising the execution of one or more program sections written in an object-oriented programming language, comprising electronic circuitry configured to perform the same steps recited in claim 11( namely: starting and creating, storing, terminating, removing, scanning, triggering); all these limitations having been addressed in claim 11, respectively.

**As per claims 23-30**, these apparatus claims have the similar limitations as, respectively, claims 12-19; hence are rejected with the corresponding rejections as set forth therein.

**As per claim 31**, this claim is the apparatus claim corresponding to claim-21; hence is rejected with the corresponding rejection as set forth therein.



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As per claim 32, this claim encompasses some corresponding limitation of claim 11 and claim 16; hence is referred to the corresponding rejection as set forth accordingly ( Note: the limitation as to send the alarm *only when* information units have been stored longer ... time inactive period would be treated the same as sending alarm when information units have been stored ... inactive) .

As per claim 33, refer to claim 14.

#### ***Response to Arguments***

4. Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan A Vu whose telephone number is (272) 272-3735. The examiner can normally be reached on 8AM-4:30PM/Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on (571)272-3719.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273-3735 ( for non-official correspondence – please consult Examiner before using) or 703-872-9306 ( for official correspondence) or redirected to customer service at 571-272-3609.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VAT  
January 12, 2005

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